Name: Date:

Polynomial Factoring solution (version 30)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 8x + 43 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(-8) \pm \sqrt{64 - 172}}{2(1)}$$

$$x = \frac{8 \pm \sqrt{-108}}{2}$$

$$x = \frac{8 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{8 \pm 6\sqrt{3}\, i}{2}$$

$$x = 4 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-7 + 6i$ and $-5 + 3i$ in standard form $(a + bi)$.**

Solution

$$(-7 + 6i) \cdot (-5 + 3i)$$

$$35 - 21i - 30i + 18i^2$$

$$35 - 21i - 30i - 18$$

$$35 - 18 - 21i - 30i$$

$$17 - 51i$$

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3. **Write function $f(x) = x^3 + 13x^2 + 54x + 72$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	13	54	72
-4		-4	-36	-72
	1	9	18	0

$$f(x) = (x + 4)(x^2 + 9x + 18)$$

$$f(x) = (x + 4)(x + 3)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 5)^2 \cdot (x + 2)^2 \cdot (x - 1)$$

Sketch a graph of polynomial $y = p(x)$.